

Claims

1. (Currently Amended) A method for making a structure, at least a portion of which is intermetallic, the method comprising:

~~machining~~ patternning at least one ~~machinable~~ patternable intermetallic lamina to form a ~~machined~~ patterned intermetallic lamina, the ~~machinable~~ patternable intermetallic lamina comprising nickel aluminide, iron aluminide or titanium aluminide;

adding at least one bonding ~~lamina or layer~~ material to the registered stack to facilitate bonding between the intermetallic lamina and a second lamina adjacent the intermetallic lamina;

stacking and registering the ~~machined~~ patterned intermetallic lamina with at least one lamina other than the bonding lamina selected from patterned lamina, non-patterned lamina and combinations thereof, thereby forming a registered stack; and

processing the registered stack to make an intermetallic structure.

Claim 2 (Canceled).

3. (Previously Presented) The method according to claim 1 where the nickel aluminide is NiAl.

4. (Previously Presented) The method according to claim 1 where the nickel aluminide is Ni₃Al.

Claim 5 (Canceled).

6. (Previously Presented) The method according to claim 1 where the iron aluminide is FeAl.

7. (Previously Presented) The method according to claim 1 where the iron aluminide is Fe₃Al.

Claim 8 (Canceled).

9. (Previously Presented) The method according to claim 1 where the titanium aluminide is TiAl.

10. (Previously Presented) The method according to claim 1 where the titanium aluminide is Ti₃Al.

11. (Currently Amended) The method according to claim 1 where the bonding ~~lamina~~ or layer material is positioned between a first intermetallic lamina and a second intermetallic lamina.

12. (Currently Amended) The method according to claim 11 where the bonding ~~lamina~~ material is substantially pure nickel.

13. (Currently Amended) The method according to claim 12 where the bonding ~~lamina~~ material has a thickness of from about 5 to about 10 microns.
14. (Currently Amended) The method according to claim 1 where ~~machining~~ patterning comprises lithography, laser ablation, an electrochemical machining process, chemical etching, plasma etching, mechanical cutting, a hydraulic process, solid abrasion, particle beam, ultrasonic machining, electromagnetic machining, wire and ram electrodischarge (EDM), waterjet, abrasive waterjet, precision plasma cutting, or combinations thereof.
15. (Previously Presented) The method according to claim 1 comprising procuring a patterned lamina or lamina blank.
16. (Currently Amended) The method according to claim 1 further comprising providing at least a second lamina in addition to the at least one ~~machinable~~ patternable intermetallic lamina, the second lamina comprising at least a first metal layer and a second metal layer.
17. (Previously Presented) The method according to claim 16 where each of the first and second metal layers comprises a substantially pure metal prior to heat treatment.
18. (Original) The method according to claim 17 where the second lamina comprises three metal layers.

19. (Original) The method according to claim 18 where one of the layers comprises an element different from the other two layers.

20. (Previously Presented) The method according to claim 19 where one of the layers is substantially pure iron, nickel, titanium or aluminum.

21. (Original) The method according to claim 18 wherein two of the layers are substantially pure aluminum, and one layer is substantially pure nickel.

22. (Original) The method according to claim 18 where two of the layers are substantially pure aluminum, and one layer is substantially pure titanium.

23. (Previously Presented) The method according to claim 1 further comprising applying an adhesive between two or more laminae.

24. (Original) The method according to claim 17 where processing comprises vacuum heating at a temperature and for a length of time sufficient to form an intermetallic.

25. (Original) The method according to claim 16 where processing further comprises liquid-phase bonding.

26. (Original) The method according to claim 16 where processing further comprises diffusion bonding.

27. (Original) The method according to claim 1 wherein the intermetallic structure includes one or more catalysts operatively associated therewith.

Claims 28-36 (Canceled).

37. (Currently Amended) The method according to claim ~~[[31]]~~1 where at least two adjacent lamina are connected by at least one post.

Claims 38-42 (Canceled).

43. (Currently Amended) The method according to claim ~~[[31]]~~1 where at least one of ~~the lamina in the registered stack of laminae~~ comprises a metal selected from aluminum, nickel, titanium, molybdenum, tantalum, copper, gold, silver, lead, tin, iron, antimony, magnesium, manganese, bismuth, germanium, tungsten, binary alloys thereof, binary intermetallics thereof, ternary alloys thereof, ternary intermetallics thereof, and combinations thereof.

44. (Original) The method according to claim 43 where the metal is a metal foil.

45. (Currently Amended) The method according to claim ~~[[31]]~~1 where the ~~stacked laminae comprise~~registered stack comprises plural intermetallic foils.

46. (Currently Amended) The method according to claim ~~[[31]]~~16 further comprising ordering metal layers in a predetermined order selected to minimize voids during heat processing that result from Kirkendall porosities.

Claim 47 (Canceled).